

CLAIMS

1. Apparatus, comprising:
a set of electrodes, adapted to be implanted at an implantation site in a patient;
5 and
a control unit, adapted to drive a first subset of the set of electrodes to apply a signal to the site configured to reduce a blood glucose level of the patient, and to drive a second subset of the set of electrodes to apply a signal to the site configured to treat obesity of the patient.
- 10 2. The apparatus according to claim 1, wherein the control unit is adapted to configure the signal applied by the first subset to comprise an ETC signal.
3. The apparatus according to claim 1, wherein the control unit is adapted to configure the signal applied by the second subset to comprise an ETC signal.
4. The apparatus according to claim 1, wherein the first subset and the second
15 subset comprise at least one electrode in common.
5. The apparatus according to claim 1, wherein the first subset and the second subset are identical.
6. The apparatus according to claim 1, wherein the first subset and the second subset have no electrodes in common.
- 20 7. The apparatus according to claim 1, wherein the implantation site includes a stomach of the patient, and wherein the set of electrodes are adapted to be fixed to the stomach.
8. The apparatus according to claim 1, wherein the implantation site includes an antrum of a stomach of the patient, and wherein the set of electrodes are adapted to be
25 fixed to the antrum.
9. The apparatus according to claim 1, wherein the implantation site includes a non-gastric site of the patient, and wherein the set of electrodes are adapted to be fixed to the non-gastric site.
10. The apparatus according to claim 1, wherein the implantation site includes an
30 intestinal site of the patient, and wherein the set of electrodes are adapted to be fixed to the intestinal site.

11. The apparatus according to claim 1, wherein the control unit is adapted to drive the first subset even in the absence of a detection of eating by the patient, and to drive the second subset responsive to a detection of eating by the patient.
12. The apparatus according to claim 1, wherein the control unit is adapted to drive the first subset responsive to a detection of eating by the patient.
13. The apparatus according to any one of claims 1-12, wherein the implantation site includes an antrum of a stomach of the patient, and wherein the set of electrodes comprises at least two pairs of electrodes, adapted to be fixed to the antrum.
14. The apparatus according to claim 13, wherein the set of electrodes comprises at least four pairs of electrodes, adapted to be fixed to the antrum.
15. The apparatus according to claim 13, wherein one of the pairs is adapted to be fixed to a posterior portion of the antrum, and wherein another one of the pairs is adapted to be fixed to an anterior portion of the antrum.
16. The apparatus according to claim 13, wherein the at least two pairs of electrodes are adapted to be fixed to the antrum in a longitudinal orientation with respect to an axis of the stomach.
17. The apparatus according to claim 13, wherein the at least two pairs of electrodes are adapted to be fixed to the antrum in a perpendicular orientation with respect to an axis of the stomach.
18. The apparatus according to claim 13, wherein the at least two pairs of electrodes are adapted to be fixed to the antrum in a mixed orientation with respect to an axis of the stomach.
19. The apparatus according to claim 13, wherein the at least two pairs of electrodes comprise a first pair and a second pair of electrodes, adapted to be fixed to the antrum at different respective orientations with respect to an axis of the stomach, wherein the first pair of electrodes is in the first subset of the set of electrodes, and wherein the second pair of electrodes is in the second subset of the set of electrodes.
20. The apparatus according to claim 19, wherein the first pair of electrodes is adapted to be fixed to the antrum in a longitudinal orientation with respect to the axis of the stomach.

21. The apparatus according to claim 19, wherein the second pair of electrodes is adapted to be fixed to the antrum in a perpendicular orientation with respect to the axis of the stomach.
22. The apparatus according to any one of claims 1-12, wherein the control unit is adapted to drive the first subset with a signal having a first frequency component, and to drive the second subset with a signal having a second frequency component, the first frequency component being smaller than the second frequency component.
23. The apparatus according to claim 22, wherein the control unit is adapted to drive the second subset to apply the signal having the second frequency component without driving the second subset to apply a pacing pulse prior to applying the signal.
24. The apparatus according to claim 22, wherein the signal having the first frequency component is non-excitatory.
25. The apparatus according to claim 22, wherein the signal having the second frequency component is non-excitatory.
26. The apparatus according to claim 22, wherein the control unit is adapted to drive the first subset to alternate application of (a) a pacing pulse and (b) the signal having the first frequency component.
27. The apparatus according to claim 26, wherein the control unit is adapted to initiate applying the signal having the first frequency component during a refractory period of the implantation site induced by the pacing pulse.
28. The apparatus according to claim 26, wherein the control unit is adapted to initiate applying the signal having the first frequency component within 500 ms following the pacing pulse.
29. The apparatus according to claim 22, wherein the first frequency component is less than 10 Hz, and wherein the second frequency component is greater than 10 Hz.
30. The apparatus according to claim 29, wherein the second frequency component is between 60 Hz and 100 Hz.
31. The apparatus according to claim 29, wherein the first frequency component is less than half of the second frequency component.

32. The apparatus according to claim 31, wherein the first frequency component is less than one fifth of the second frequency component.

33. A method, comprising:

fixing at least two pairs of electrodes to a stomach site of a patient, in a longitudinal orientation with respect to an axis of the stomach; and
5 driving the electrodes to apply a signal to the site configured to treat a pathology of the patient.

34. A method, comprising:

fixing at least two pairs of electrodes to a stomach site of a patient, in a perpendicular orientation with respect to an axis of the stomach; and
10 driving the electrodes to apply a signal to the site configured to treat a pathology of the patient.

35. A method, comprising:

fixing at least two pairs of electrodes to a stomach site of a patient, in a mixed orientation with respect to an axis of the stomach; and
15 driving the electrodes to apply a signal to the site configured to treat a pathology of the patient.

36. The method according to any one of claims 33-35, wherein the pathology includes diabetes.

20 37. The method according to any one of claims 33-35, wherein the pathology includes obesity.

38. The method according to any one of claims 33-35, wherein driving the electrodes comprises driving the electrodes even in the absence of a detection of eating by the patient.

25 39. The method according to any one of claims 33-35, wherein driving the electrodes comprises driving the electrodes responsive to a detection of eating by the patient.

40. The method according to any one of claims 33-35, wherein fixing the at least two pairs of electrodes comprises fixing the at least two pairs of electrodes to an
30 antrum of the stomach of the patient.

41. The method according to claim 40, wherein fixing the at least two pairs of electrodes comprises fixing at least four pairs of electrodes to the antrum.

42. The method according to claim 40, wherein fixing the at least two pairs of electrodes comprises fixing one of the pairs to a posterior portion of the antrum and
5 fixing another one of the pairs to an anterior portion of the antrum.

43. The method according to any one of claims 33-35, wherein driving the electrodes to apply the signal comprises driving the electrodes to apply an ETC signal having a frequency component.

44. The method according to claim 43, wherein driving the electrodes to apply the
10 ETC signal comprises driving the electrodes to apply the ETC signal without driving the electrodes to apply a pacing pulse prior to applying the ETC signal.

45. The method according to claim 43, comprising driving the electrodes to alternate application of (a) a pacing pulse and (b) the ETC signal.

46. The method according to claim 45, comprising initiating applying the ETC
15 signal during a refractory period of the stomach site induced by the pacing pulse.

47. The method according to claim 45, comprising initiating applying the ETC signal within 500 ms following the pacing pulse.

48. The method according to claim 43, wherein driving the electrodes comprises setting the frequency component to be less than 10 Hz.

20 49. The method according to claim 43, wherein driving the electrodes comprises setting the frequency component to be greater than 10 Hz.